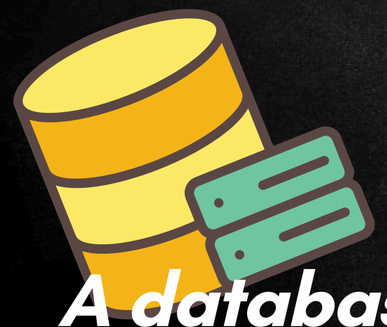
SQL BOOTCAMP

THE ULTIMATE GUIDE

What is Database?



A database is an organized collection of data stored electronically.
Think of it as a digital version of an Excel file... but much more

What is SQL?

SQL (Structured Query Language) is a language used to communicate with databases.

It helps us store, retrieve, and manipulate data efficiently.

Why SQL?

We need SQL to talk to the database — it's the bridge between humans and data.

Let's set up our ENVIRONMENT

You don't need to be a genius — just be curious and ask questions!

DDL COMMANDS

DDL STANDS FOR DATA DEFINITION LANGUAGE. THESE ARE SQL COMMANDS USED TO DEFINE, MODIFY, OR DELETE THE STRUCTURE OF DATABASE OBJECTS SUCH AS TABLES, INDEXES, AND SCHEMAS.

DDL COMMANDS

- CREATE
- ALTER
- DROP
- TRUNCATE

CONSTRAINTS

CONSTRAINTS IN SQL ARE RULES APPLIED TO TABLE COLUMNS TO ENFORCE DATA INTEGRITY AND ACCURACY. THEY ENSURE THAT THE DATA ENTERED INTO A DATABASE IS VALID, CONSISTENT, AND FOLLOWS THE RULES YOU DEFINE.

KEYS IN SQL

UNIQUE KEY

- ENSURES THAT ALL VALUES IN A COLUMN (OR COMBINATION OF COLUMNS) ARE UNIQUE.
- CAN HAVE ONE NULL (IN MOST DATABASES) PER COLUMN.
- YOU CAN HAVE MULTIPLE UNIQUE KEYS IN A TABLE.

PRIMARY KEY

- UNIQUELY IDENTIFIES EACH RECORD IN A TABLE.
- CANNOT HAVE NULL VALUES.
- ONLY ONE PRIMARY KEY PER TABLE.
- EXAMPLE:

FOREIGN KEY

- CREATES A LINK BETWEEN TWO TABLES.
- ENSURES THAT VALUES IN A COLUMN EXIST IN ANOTHER TABLE'S PRIMARY KEY.
- EXAMPLE:

CANDIDATE KEY

- A COLUMN, OR SET OF COLUMNS, THAT CAN UNIQUELY IDENTIFY A RECORD.
- A TABLE CAN HAVE MULTIPLE CANDIDATE KEYS.
- PRIMARY KEY IS CHOSEN FROM CANDIDATE KEYS.
- EXAMPLE:

COMPOSITE KEY

- A PRIMARY KEY MADE OF TWO OR MORE COLUMNS.
- UNIQUELY IDENTIFIES A RECORD USING A COMBINATION OF COLUMNS.
- EXAMPLE:

SURROGATE KEY

- SURROGATE KEY
- AN ARTIFICIAL KEY, USUALLY AN AUTO-INCREMENT NUMBER.
- USED WHEN NATURAL KEYS ARE INCONVENIENT OR TOO LONG.
- EXAMPLE:

EXECUTION FLOW

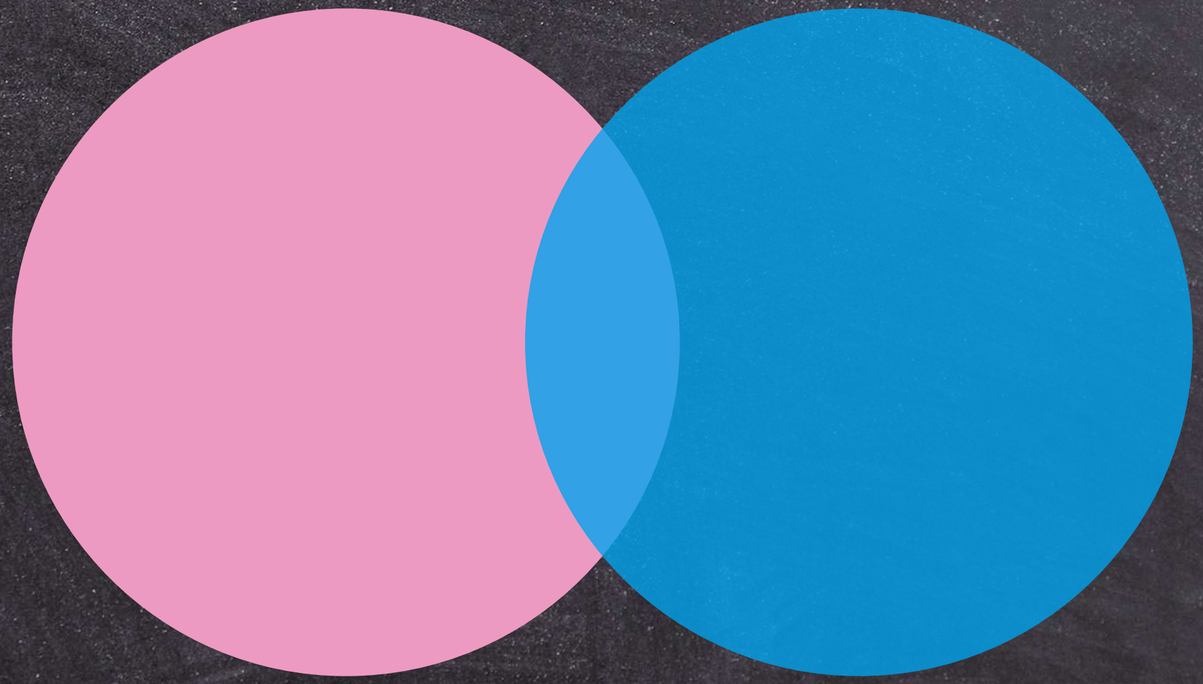
JOINS

WHAT ARE JOINS

O_ID	CUST_ID	PRICE
1	101	1000
2	201	1100
3	101	1200

ID	NAME	EMAIL
101	love	aa
201	ansh	bb
301	lamba	cc

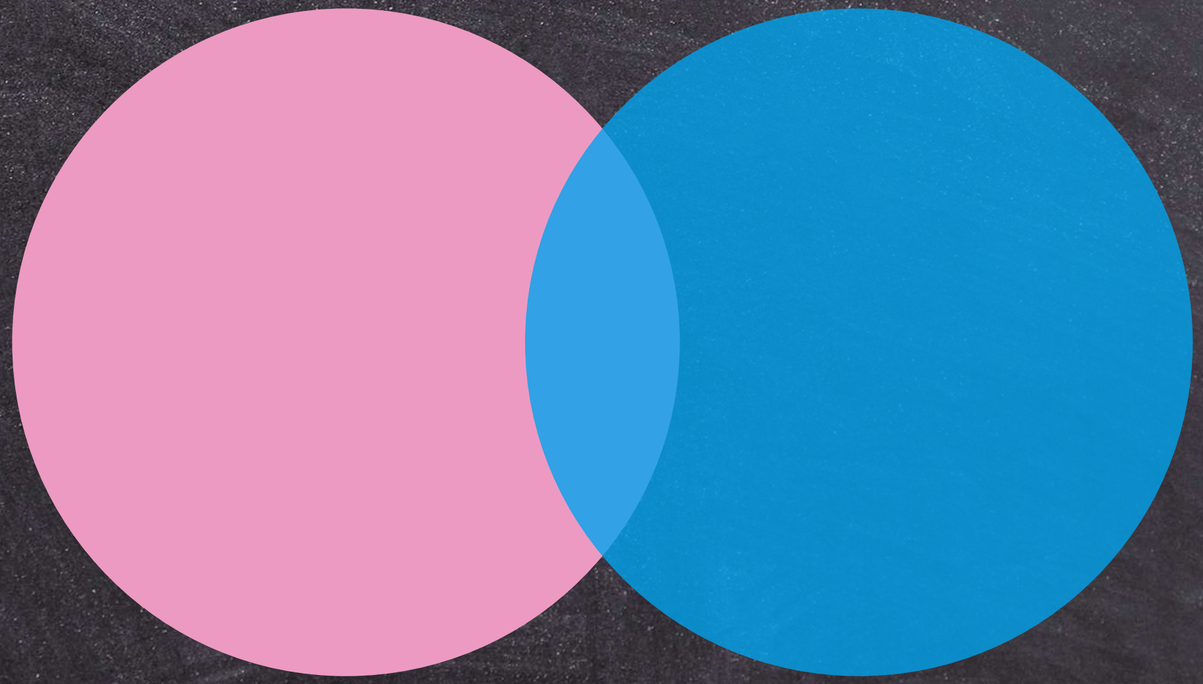
INNER JOIN



O_ID	CUST_ID	PRICE
1	101	1000
2	201	1100
3	501	1200

ID	NAME	EMAIL
101	love	aa
201	ansh	bb
301	lamba	cc

LEFT JOIN



O_ID	CUST_ID	PRICE
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ID	NAME	EMAIL
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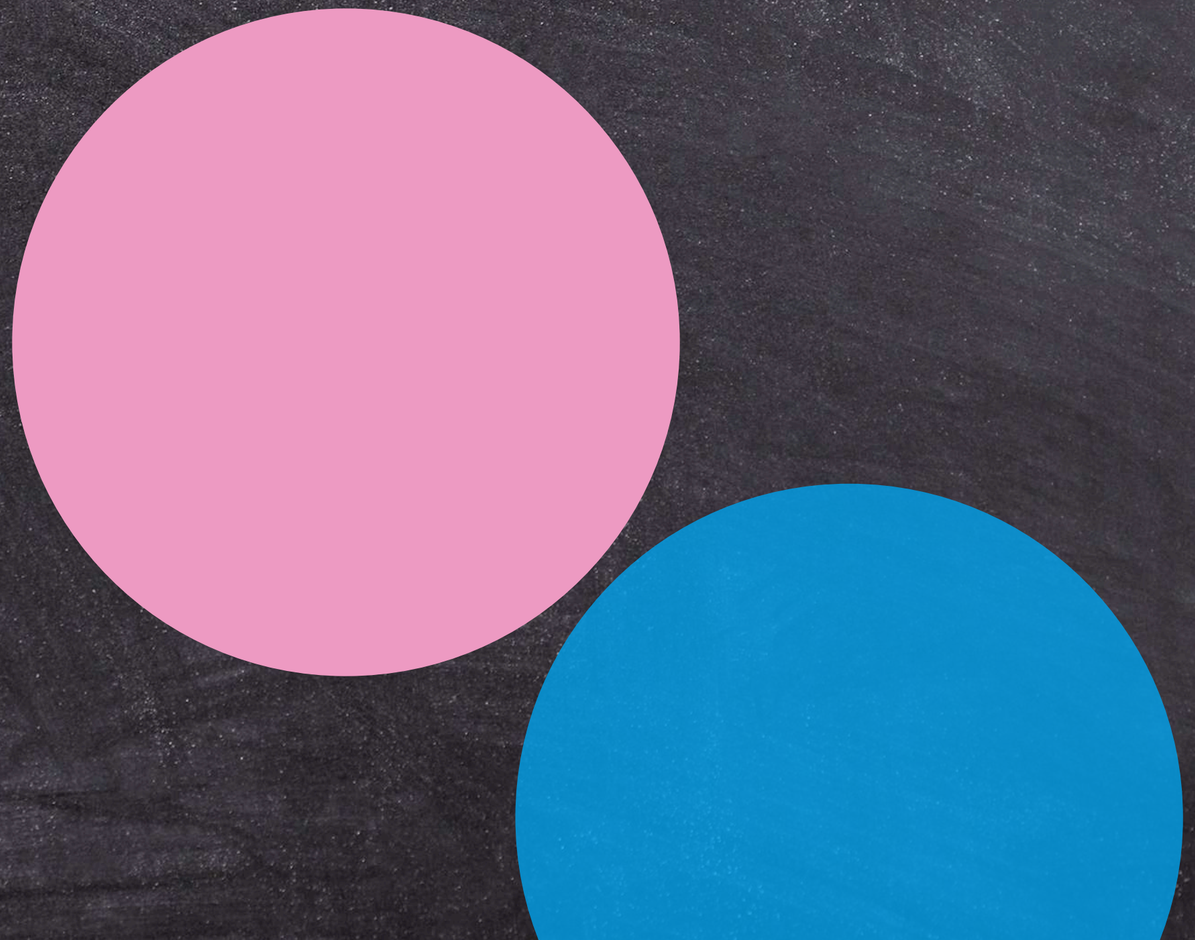
RIGHT JOIN



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1	101	1000
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ID	NAME	EMAIL
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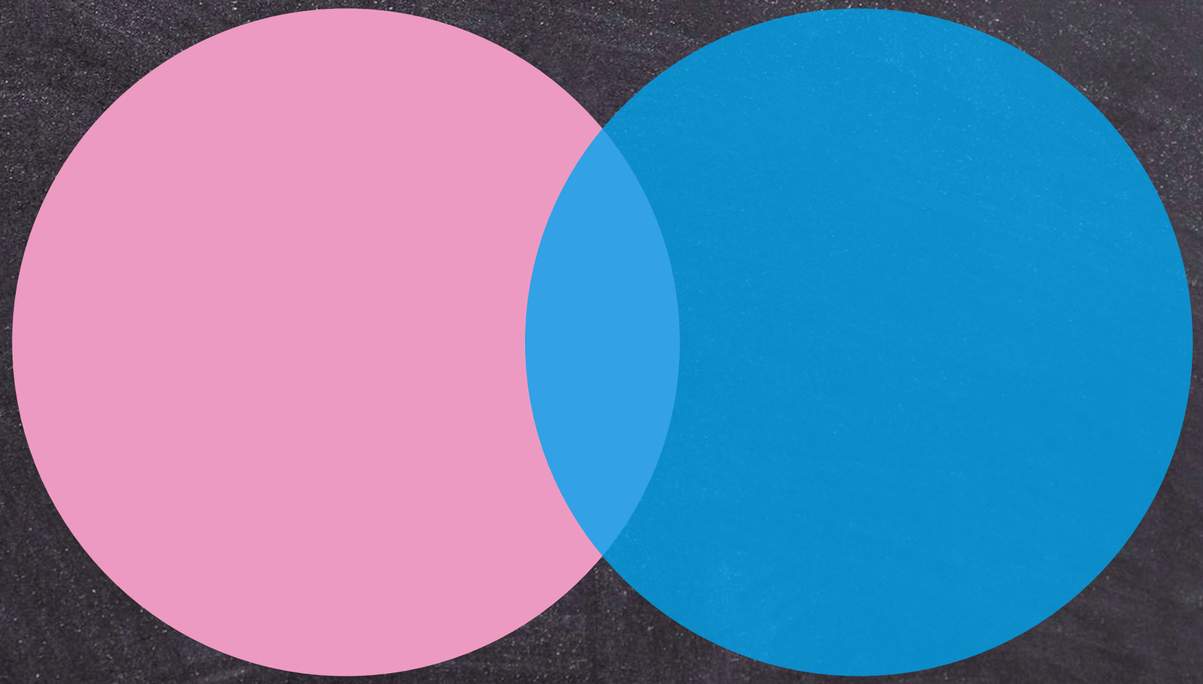
FULL JOIN



O_ID	CUST_ID	PRICE
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DML COMMANDS

TRANSFORM

WINDOW FUNCTIONS

WINDOW FUNCT

WINDOW FUNCTIONS IN SQL ARE SPECIAL FUNCTIONS THAT PERFORM CALCULATIONS ACROSS A SET OF ROWS — BUT WITHOUT COLLAPSING THEM INTO A SINGLE OUTPUT ROW (UNLIKE AGGREGATE FUNCTIONS).

THEY ALLOW YOU TO DO THINGS LIKE RANKING, RUNNING TOTALS, MOVING AVERAGES, AND COMPARISONS BETWEEN ROWS WHILE STILL KEEPING ALL THE ROWS IN THE RESULT.

unit_price	row_number()	rank()	dense_rank()
90			
90			
100			

SUBQUERY

SQL SUBQUERIES ARE QUERIES WRITTEN INSIDE ANOTHER QUERY — BASICALLY, A QUERY WITHIN A QUERY.
THEY'RE USED WHEN YOU NEED TO GET A RESULT FROM ONE QUERY AND USE IT INSIDE ANOTHER.

CTES

VIEWS

STORED PROCEDURE

A STORED PROCEDURE IN MYSQL IS A PREDEFINED SET OF SQL STATEMENTS THAT ARE STORED IN THE DATABASE AND CAN BE EXECUTED (CALLED) WHENEVER NEEDED.
THINK OF IT LIKE A FUNCTION IN PROGRAMMING — YOU WRITE THE LOGIC ONCE AND THEN REUSE IT MULTIPLE TIMES.

FUNCTIONS

FUNCTIONS IN MYSQL ARE PREDEFINED OR USER-DEFINED ROUTINES THAT PERFORM OPERATIONS ON DATA AND RETURN A SINGLE VALUE. THEY ARE VERY USEFUL FOR MANIPULATING DATA, PERFORMING CALCULATIONS, AND SIMPLIFYING QUERIES.